

Amendment

The Examiner is respectfully requested to amend the above-identified application as follows.

IN THE SPECIFICATION:

Please substitute the paragraph starting at page 3, line 8 and ending at line 20 with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

a1 --However, such memories increase the cost of the overall printer apparatus accordingly. In the case of a disposable type of printhead, a non-volatile memory is also disposed every time the printhead is exchanged. This is not economical. Furthermore, even in the case of a printhead which is not of the disposable type but can be repetitively used by exchanging or refilling only ink (or an ink tank), since the lifetime of the printhead is normally much shorter than that of the printer apparatus main body, the printhead must be exchanged several times during the lifetime of the printer main body. This is also not economical as with the case of using the disposable type of printhead.--

Please substitute the paragraph starting at page 5, line 19 and ending at page 6, line 10 with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

ad --According to another aspect of the present invention, the foregoing object is attained by providing a printing system including the above-described printing apparatus, and a host connecting to the printing apparatus and capable of communicating with a second system via a network, the host comprising: input means for inputting individual information of a printhead indicated on the printhead or an accessory of the printhead in a format identifiable to human or an electronic device via man-machine interactive operation or the electronic device; retrieve means for accessing the second system via the network on the basis of the individual information of the printhead inputted by the input means, and retrieving characteristic information of the printhead corresponding to the individual information of the printhead; and transfer means for transferring the characteristic information of the printhead retrieved by the retrieve means to the printing apparatus.--

[Please substitute the paragraph starting at page 6, line 11 and ending at line 13 with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.]

--Note that the network includes a LAN or Internet, and the individual information of the printhead can be a production number of the printhead.--

Please substitute the paragraph starting at page 9, line 19 and ending at page 11, line 2 with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

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--Fig. 1 is a perspective view showing the outer appearance of an ink-jet printer 20 (hereinafter referred to as a printer) as a typical embodiment of the present invention. Referring to Fig. 1, a carriage HC engages with a spiral groove 5005 of a lead screw 5004, which rotates via driving force transmission gears 5009 to 5011 upon forward/reverse rotation of a driving motor 5013. The carriage HC has a pin (not shown), and is reciprocally scanned in the directions of arrows a and b in Fig. 1. An integrated ink-jet cartridge IJC which incorporates a printhead IJH and an ink tank IT is mounted on the carriage HC. Reference numeral 5002 denotes a sheet pressing plate, which presses a paper sheet against a platen 5000, ranging from one end to the other end of the scanning path of the carriage. Reference numerals 5007 and 5008 denote photocouplers which serve as a home position detector for recognizing the presence of a lever 5006 of the carriage in a corresponding region, and used for switching, e.g., the rotating direction of the motor 5013. Reference numeral 5016 denotes a member for supporting a cap member 5022, which caps the front surface of the printing head IJH; and 5015, a suction device for suctioning ink residue through the interior of the cap member. The suction device 5015 performs suction recovery of the printing head via an opening 5023 of the cap member 5015. Reference numeral 5017 denotes a cleaning blade; and 5019, a member which allows the blade to be movable in the back-and-forth direction of the blade. These members are supported on a main unit support plate 5018. The shape of the blade is not limited to this, but a known cleaning blade can be used in this embodiment. Reference numeral 5021 denotes a lever for initiating a suction operation in the suction recovery operation. The lever 5021 moves upon movement of a cam 5020, which engages with the carriage, and receives a driving

force from the driving motor via a known transmission mechanism such as clutch switching.--

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amx.
[Please substitute the paragraph starting at page 11, line 3 and ending at line 9 with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.]

--The capping, cleaning, and suction recovery operations are performed at their corresponding positions upon operation of the lead screw 5004 when the carriage reaches the home-position side region. However, the present invention is not limited to this arrangement as long as desired operations are performed at known timings.--

Please substitute the paragraph starting at page 11, line 14 and ending at page 12, line 7 with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

04
--Fig. 2 is a block diagram showing the arrangement of a control circuit of the printer 20. Referring to Fig. 2 showing the control circuit, reference numeral 1700 denotes a USB interface for inputting a printing signal from a personal computer 21 (hereinafter referred to as a host); 1701, an MPU; 1702, a programmable ROM for storing a control program executed by the MPU 1701 and necessary control data; and 1703, a DRAM for storing various data (the printing signal, printing data supplied to the printhead

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IJH, and the like). Reference numeral 1704 denotes a gate array (G.A.) for performing supply control of printing data to the printhead IJH. The gate array 1704 also performs data transfer control among the interface 1700, the MPU 1701, and the RAM 1703.

Reference numeral 1710 denotes a carrier motor for carrying the printhead IJH; and 1709, a conveyance motor for conveying a printing medium (e.g., a printing sheet). Reference numeral 1705 denotes a head driver for driving the printhead IJH; and 1706 and 1707, motor drivers for driving the conveyance motor 1709 and the carrier motor 1710.--

Please substitute the paragraph starting at page 13, line 18 and ending at page 14, line 3 with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

Q5
--As the printhead IJH detachable from the printer apparatus used in this embodiment, a plurality of types of printheads are available: for example, a monochrome printhead, color printhead, photo-quality printhead, and the like. A user can selectively attach an optimal one of these printheads according to the user's need. Each of these printheads has a signal terminal which can output a 2-bit signal regardless of its type.

When a printhead is mounted on the printer 20, it outputs a 2-bit ON/OFF signal, so that the printer 20 can identify the type of currently mounted printhead. In this arrangement, up to four different printhead types can be identified.--

Please substitute the paragraph starting at page 17, line 16 and ending at page 18, line 4 with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

ab --When a user who has purchased the printer apparatus attaches a printhead for the first time, when a user who has purchased a commercially available optional printhead attaches that printhead for the first time, or when the lifetime of a printhead has expired and a user exchanges that printhead with a separately purchased one, he or she activates utility software (which is attached to the printer apparatus in the form of a CD-ROM or the like together with driver software and the like upon shipping from a factory) on the host 21, and inputs the characteristic information of the printhead printed on the packaging paper box 25 at a keyboard or the like of the host 21 in accordance with an instruction on the window displayed on a display (LCD, CRT, PDP, or the like) of the host 21 upon executing that software.--

Please substitute the paragraph starting at page 18, line 16 and ending at line 26 with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

an --Once the characteristic information is written into the EEPROM 1708, a print process is performed using that characteristic information. Since the characteristic information of the printhead is written for each type of printhead, it need only be written

once when the printhead is attached to the printer for the first time. Hence, the user need not write the characteristic information every time he or she exchanges the printhead with another type of printhead according to his or her purpose (e.g., the user exchanges a monochrome printhead with a color printhead).--

Please substitute the paragraph starting at page 23, line 20 and ending at line 27 with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Note that in the above embodiments, the liquid discharged from the printhead has been described as ink, and the liquid contained in the ink tank has been described as ink. However, the liquid is not limited to ink. For example, the ink tank may contain processing liquid or the like discharged to a print medium to improve fixability or water repellency of a printed image or to increase the image quality.--

[Please substitute the paragraph starting at page 24, line 1 and ending at line 9 with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.]

--The embodiments described above have exemplified a printer, which comprises means (e.g., an electrothermal transducer, laser beam generator, and the like) for generating heat energy as energy utilized for execution of ink discharge, and causes a

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change in state of the ink by the heat energy, among the ink-jet printers. According to this ink-jet printer and printing method, a high-density, high-precision printing operation can be attained.--

Please substitute the paragraph starting at page 28, line 14 and ending at page 29, line 4 with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

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--Further, the object of the present invention can be also achieved by providing a storage medium (or recording medium) storing software program code for performing the aforesaid processes in a system or an apparatus, reading the program code with a computer (e.g., CPU, MPU) of the system or apparatus from the storage medium, then executing the program. In this case, the program code read from the storage medium realizes the functions according to the embodiments, and the storage medium storing the program code constitutes the invention. Furthermore, besides the aforesaid functions according to the above embodiments being realized by executing the program code which is read by a computer, the present invention includes a case where an OS (operating system) or the like working in the computer performs a part of or entire processes in accordance with designations of the program code and realizes functions according to the above embodiments.--

⌈ Please substitute the paragraph starting at page 29, line 5 and ending at line 14 with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached. ⌋

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--Furthermore, the present invention also includes a case where, after the program code read from the storage medium is written in a function expansion card which is inserted into the computer or in a memory provided in a function expansion unit which is connected to the computer, a CPU or the like contained in the function expansion card or unit performs a part of or entire processes in accordance with designations of the program code and realizes functions of the above embodiments.--

IN THE CLAIMS:

Please amend Claims 1, 3, 4, 6, 9-12, 14, 16, 18 and 20-22 to read as follows. A marked-up copy of Claims 1, 3, 4, 6, 9-12, 14, 16, 18 and 20-22, showing the changes made thereto, is attached. Note that all the claims currently pending in this application, including those not presently being amended, have been reproduced below for the Examiner's convenience.

210 Sub
1. (Amended) A printing apparatus for printing on a printing medium using a printhead, comprising:
